

Amendments to the Drawings:

The attached sheet of drawing includes changes to FIG. 1. The sheet replaces the original sheet. Element “1” has been changed to “10”.

Attachments: 1 Replacement Sheet

REMARKS

Claims 1-18 and 19-24 are pending in this application. Applicant has made no amendment to the originally pending claims and added new claims 19-24. No new matter is added by the additional claims as they are fully supported by the specification and drawings.

In the Office Action, the Examiner indicated that claims 7, 13 and 16 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant gratefully acknowledges the Examiner's indication of allowable subject matter.

The Examiner objected to certain informalities in the specification. First, the Examiner stated that the ink jet printing head 10 is not listed in the figures. Applicant is herewith submitting replacement sheet for FIG. 1 in which element "1" has been amended to "10".

Second, the Examiner stated that the nozzles 24-3 and 24-4 are not listed in Figures 2 through 6. Applicant submits that those reference numerals are shown in FIG. 10.

Third, the Examiner stated that the nozzles 24 are not listed in Figures 8A and 8B. Applicant submits that those reference numerals are shown in FIGS. 3, 4, 5 and 10.

Fourth, the Examiner stated that the manifold chambers 26a-h are not listed in the figures. Applicant has amended the specification such that they are referred to as simply "26".

More substantively, the Examiner rejected claims 1-6, 8-12, 14-15, 17 and 18 under 35 U.S.C. Section 102(b) as being anticipated by Takeuchi (European Patent No. 0 600 743 A2). Applicant respectfully traverses the rejection.

The invention according to claim 1 concerns a relatively large-sized ink-jet printing head which has a relatively large number of nozzles and which is easy and economical to develop and manufacture (see paragraph 11). Conventionally, manufacturing such large printing heads suffered from increased defects because of the difficulty in matching the spacing distance between adjacent individual electrodes formed on the fired piezoelectric ceramic plates, with the spacing distance of the adjacent pressure chambers, as the length of the piezoelectric ceramic plates is increased.

According to the invention of claim 1, however, such problem is solved or at least reduced by a novel design that includes a horizontal communication passage between a pressure chamber and a corresponding nozzle (see, for example, paragraphs 52-60). For example, see FIG. 4 (side view) and FIG. 5A (plan view) of the horizontal communication passage 50 which is

between the pressure chamber 23 and its corresponding nozzle 24. This novel feature is recited in claim 1 as “a plurality of communication passages for communication *between the respective pressure chambers and the respective nozzles*” and “wherein each of said communication passages includes at least one *horizontally extending portion* which extends in parallel with a horizontal direction of said cavity unit” (emphasis added).

The Examiner, at the bottom of page 3 of the Office Action, points to element 72 in FIG. 1 of Takeuchi as teaching a communication passage having a “horizontally extending portion”. Applicant respectfully disagrees. As stated above, the “horizontally extending portion” is part of a communication passage which is between a pressure chamber and its nozzle. The element 72 pointed to by the Examiner is not between a pressure chamber and its nozzle. Rather, it’s disposed between a pressure chamber 56 and an ink source. In other words, element 72 is not part of a communication passage between a pressure chamber and its nozzle, but merely corresponds to a common manifold chamber that supplies ink to multiple pressure chambers. In the present specification, element 72 of Takeuchi corresponds to manifold chamber 26 (see FIG. 3A of the present specification). Accordingly, Takeuchi neither teaches nor suggests the novel combination as recited in claim 1.

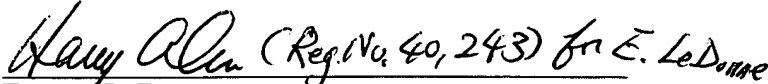
Applicant submits that dependent claims 2-6, 8-12, 14-15, 17 and 18 are also patentable by virtue of their dependency from independent claim 1.

The Examiner also rejected claim 17 under 35 U.S.C. Section 102(b) as being obvious over Takeuchi in view of Takagi (U.S. Patent Pub. No. 2002/0024567). Applicant submits that claim 17 is also patentable by virtue of its dependency from independent claim 1.

New independent claim 19 recites the feature discussed above with respect to claim 1. Specifically, claim 19 recites that “each of said communication passages includes at least one horizontally extending portion which extends in parallel with a horizontal direction of said cavity unit”. Dependent claims 20-24 all depend from either independent claim 1 or 19. Accordingly, they are patentable by virtue of their dependency from independent claims 1 or 19.

Based upon the above amendments and remarks, Applicant respectfully requests reconsideration of this application and its earlier allowance. Should the Examiner feel that a telephone conference with Applicant's attorney would expedite the prosecution of this application, the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,

 (Reg. No. 40,243) for E. LeDonne

Eugene LeDonne
Reg. No. 35,930
REED SMITH LLP
599 Lexington Avenue
New York, NY 10022
(P) 212-521-5402
Attorney for Applicant

HKA: